

13  
layer 20 is used in both the steps of forming the metal layers (at least the first metal layer 30) and of forming the brazing alloy 44; hence, the process is simplified. When the resist layer 20 is used instead of the resin layer 24, the second metal layer 33 is preferably formed so as to substantially be flush with the resist layer 20.

IN THE CLAIMS:

Please replace claims 9 and 10 as follows:

14  
9. (Amended) The method for forming a bump according to claim 5, the first metal layer being formed so as to protrude from the through hole so that the first metal layer has a tip having a width which is larger than a width of the through hole.

10. (Amended) The method for forming a bump according to claim 5, the second metal layer being formed so as to protrude from the through hole so that the second metal layer has a tip having a width which is larger than a width of the through hole.

REMARKS

Claims 1-32 are pending. Claims 28-30 have been withdrawn from consideration. By this Amendment, the specification is amended, and claims 9 and 10 are amended. Reconsideration based on the above amendments and following remarks is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten paragraph (37 C.F.R. §1.121(b)(1)(iii)) and claim (37 C.F.R. §1.121(c)(1)(ii)).

**I. THE ABSTRACT SATISFIES ALL FORMAL REQUIREMENTS**

The Office Action objects to the Abstract because of an informality. This objection is respectfully traversed.

The Abstract includes language pertaining to independent claim 1. The Abstract, unlike the Office Action's assertion, does not include any language associated with, or

pertaining to, an "anisotropically conductive material 74." Withdrawal of the objection to the Abstract is respectfully requested.

**II. THE SPECIFICATION SATISFIES ALL FORMAL REQUIREMENTS**

The Office Action objects to the specification for various informalities. The specification has been amended to obviate this objection. Withdrawal of the objection to the specification is respectfully requested.

**III. CLAIMS 9 AND 10 SATISFY ALL FORMAL REQUIREMENTS**

The Office Action objects to claims 9 and 10 for various informalities. Claims 9 and 10 have been amended in accordance with the Office Action's recommendation to obviate this objection. Withdrawal of the objection to the claims is respectfully requested.

**IV. THE CLAIMS DEFINE ALLOWABLE SUBJECT MATTER**

The Office Action rejects claim 1-3, 5-8, 10, 13, 15, 17, 18, 20, 21, 25, 26, 31 and 32 under 35 U.S.C. §102(e) as unpatentable over U.S. Patent No. 6,093,964 to Saitoh (hereinafter "Saitoh"); claims 1, 5, 11, 12 and 19 under 35 U.S.C. §102(b) as unpatentable over U.S. Patent No. 5,310,699 to Chikawa et al. (hereinafter "Chikawa"); claim 9 under 35 U.S.C. §103(a) as unpatentable over Saitoh; claim 14 under 35 U.S.C. §103(a) as unpatentable over Saitoh or Chikawa in view of U.S. Patent No. 6,372,547 to Nakamura et al. (hereinafter "Nakamura"); claim 16 under 35 U.S.C. §103(a) as unpatentable over Saitoh in view of Nakamura; and claims 22-24 under 35 U.S.C. §103(a) as unpatentable over Chikawa in view of U.S. Patent No. 5,830,533 to Lin et al. (hereinafter "Lin"). These rejections are respectfully traversed.

Regarding claim 1 and its dependent claims 3, 5-8, 10, 13, 15, 17, 18, 20, 21, 25, 26, 31 and 32, the Office Action asserts that Saitoh anticipates the claimed invention. Applicants respectfully disagree with the Office Action's assertion.

For example, Saitoh, at col. 4, lines 7-11 and 27-40, and in Figs. 3-5, discloses that an additional metal film 5, comprising a plurality of metal layers, is formed on the surface of the electrode 3 and the insulating layer (undesigned) formed on the semiconductor chip 1. According to Saitoh, a photoresist layer 7 is next applied over metal layer 5, and then the photoresist layer 7 on top of electrode 3 is opened to allow a gold layer 13 and an indium layer 15 to be formed on top of the metal layer 5. The fabrication steps for forming a bump, as well as the semiconductor bump configuration /arrangement disclosed in Saitoh, are different than the claimed invention.

Regarding claim 1 and its dependent claims 5, 11, 12 and 19, the Office Action asserts that Chikawa anticipates the claimed invention. Applicants respectfully disagree with the Office Action's assertion.

For example, Chikawa, at col. 2, lines 37-66, col. 3, line 63 to col. 4, line 50, and in Figs. 2A-2E, discloses a semiconductor substrate 1 on which an insulative layer 2 is formed, an electrode 3 being on the insulative layer 2. A passivation layer 4 of phospho-silicate glass is then formed over the surface of the electrode 3 and insulative layer 2. A multi-layer metal film 6 is next formed over the whole surface of the semiconductor chip. Then, the multi-layer film 6 is masked by a photoresist layer 9, excluding the section where a bump electrode 7 is formed with a metal. As with Saitoh, the fabrication steps for forming a bump, as well as the semiconductor bump configuration /arrangement disclosed in Chikawa, are different than the claimed invention.

Claims 2-27 and 31-32 depend from independent claim 1.

Further, neither Nakamura nor Lin makes up for the deficiencies of Saitoh or Chikawa.

For at least these reasons, it is respectfully submitted that independent claim 1 distinguishes over Saitoh and Chikawa. Claims 2-27 and 31-32, which depend from

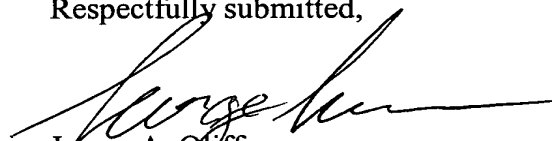
independent claim 1, also are patentable over the applied art for at least the reasons discussed above as well as for the additional features they recite. Applicants respectfully request that the rejections under 35 U.S.C. §102(b), §102(e) and §103(a) be withdrawn.

**V. CONCLUSION**

For at least the reasons discussed above, it is respectfully submitted that this application is in condition for allowance.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075

George P. Simion  
Registration No. 47,089

JAO:GPS/hs

Attachment:  
Appendix

Date: February 21, 2003

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

<p><b>DEPOSIT ACCOUNT USE AUTHORIZATION</b> Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>
---

## APPENDIX

## Changes to Specification:

Page 7, lines 23-24:

Fig. 713(A) to Fig. 13(C) show a method for forming a bump according to an eighth embodiment of the present invention.

Page 8, lines 1-2:

Fig. 17(A)19 shows a method for forming a bump according to a tenth embodiment of the present invention.

Page 20, lines 20-27:

[0123] The resin layer 24 may be formed around the metal layers (the first metal layer 30 and the second metal layer 33) after the resist layer 20 is removed. Alternatively, the resist layer 20 may be left and used instead of the resin layer 24. In the latter case, the resist layer 20 is used in both the steps of forming the metal layers (at least the first metal layer 30) and of forming the brazing alloy 44; hence, the process is simplified. When the resist layer 20 is used instead of the resin layer 24, the second metal layer 33 is preferably formed so as to substantially be ~~flux~~flush with the resist layer 20.

## Changes to Claims:

The following is a marked-up version of the amended claims:

9. (Amended) The method for forming a bump according to ~~any one of~~ claim 5, the first metal layer being formed so as to protrude from the through hole so that the first metal layer has a tip having a width which is larger than a width of the through hole.

10. (Amended) The method for forming a bump according to ~~any one of~~ claim 5, the second metal layer being formed so as to protrude from the through hole so that the second metal layer has a tip having a width which is larger than a width of the through hole.